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- Sub-B1* →
- A1*
1. (Amended) A process for dewatering a slurry of hydrophilic particulate material comprising:
    - i) increasing the hydrophobicity of said material;
    - ii) adding a nonionic surfactant of low hydrophile-lipophile balance (HLB) number dissolved in at least one organic solvent;
    - iii) agitating said slurry to allow for said nonionic surfactant to adsorb on the surface of said material so that its hydrophobicity is increased; and
    - iv) subjecting the agitated slurry containing said material to a mechanical method of dewatering.
  2. (Amended) The process of claim 1 wherein said particulate matter comprises particles of less than 2mm in size.
  3. (Amended) The process of claim 1 wherein the nonionic surfactant has its HLB number less than 15.
  4. (Amended) The process of claim 1 wherein said increasing the hydrophobicity step is achieved by using a surfactant or collector.

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*Dep. B2*  
8. (Amended) The process of claim 1 wherein said increasing the hydrophobicity step comprises increasing the hydrophobicity of said material to exhibit a water contact angle less than 90°.

9. (Amended) The process of claim 1 wherein the particulate material includes material selected from the group consisting of: minerals, coal, plastics, metals, metal powders and fly ash.

*A2*  
10. (Amended) The process of claim 1 wherein the said mechanical method of dewatering is selected from the group consisting of: vacuum filtration, pressure filtration, centrifugal filtration, and centrifugation.

*Dep. B2*  
11. (Amended) The process of claim 1 wherein the low HLB surfactant is selected from the group consisting of: fatty acids, fatty esters, phosphate esters, hydrophobic polymers, ethers, glycol derivatives, sarcosine derivatives, silicon-based surfactants and polymers, sorbitan derivatives, sucrose and glucose esters and derivatives, lanolin-based derivatives, glycerol esters, ethoxylated fatty esters, ethoxylated amines and amides, ethoxylated linear alcohols, ethoxylated tryglycerides, ethoxylated vegetable oils, and ethoxylated fatty acids.

*Dep. B3*  
12. (Amended) The process of claim 11 wherein said low HLB surfactant is blended with a vegetable, fish or animal oil containing triacylglycerols.

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13. (Amended) The process of claim 1 wherein said organic solvent includes a solvent selected from the group consisting of: light hydrocarbon oils and short-chain alcohols.

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cont.  
14. (Amended) The process of claim 4 wherein said surfactant or collector comprises a high HLB surfactant having a polar head configured to interact with the surface of said particulate material.

15. (Amended) The process of claim 4 wherein said collectors are selected from the group consisting of: thiols and xanthates.

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18. (Amended) A process for dewatering a slurry of particulate material comprising:  
i) increasing the hydrophobicity of said material;  
ii) adding at least one inorganic electrolyte to the slurry;  
iii) adding a nonionic surfactant of low HLB number dissolved in an at least one organic solvent;  
iv) agitating said slurry to allow for said nonionic surfactant to adsorb on the surface of said material so that its hydrophobicity is increased; and  
v) subjecting the agitated slurry containing said material to a mechanical method of dewatering.

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cont.

19. (Amended) The process of claim 18 wherein the said inorganic electrolyte is selected from the group consisting of: salts of monovalent, divalent and trivalent cations and anions.

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22. (Amended) The process of claim 18 wherein said particulate matter comprises particles of less than 2mm in size.

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25. (Amended) A process for dewatering a slurry of particulate material comprising:

- i) increasing the hydrophobicity of said material;
- ii) adding a nonionic surfactant of low HLB number dissolved in at least one organic solvent;
- iii) agitating said slurry to allow for said nonionic surfactant to adsorb on the surface of said material so that its hydrophobicity is increased; and
- iv) subjecting the agitated slurry containing said material to a filtration process in which a filter cake formed in said filtration process is subjected to vibratory means.

26. (Amended) The process for claim 25 wherein the vibratory means includes means selected from the group consisting of: ultrasonic, mechanical and acoustic means.

27. (Amended) The process of claim 25 wherein said particulate matter comprises particles of less than 2mm in size.

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30. (Amended) A process for dewatering a slurry of particulate material comprising:

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- i) increasing the hydrophobicity of said material;
  - ii) adding a nonionic surfactant of low HLB number dissolved in at least one organic solvent;
  - iii) agitating said slurry to allow for said nonionic surfactant to adsorb on the surface of said material so that its hydrophobicity is increased; and
  - iv) subjecting the agitated slurry containing the material to a filtration process in which a surface tension lowering reagent is added during cake drying cycle time to a filter cake formed in said filtration process, said surface tension lowering agent comprising a mist.

31. (Amended) The process for claim 30 wherein the surface tension lowering agent is selected from the group consisting of: short-chain alcohols, light hydrocarbon oils, and surfactants.

32. (Amended) The process of claim 30 wherein said particulate matter comprises particles of less than 2mm in size.

35. (Amended) A process for dewatering a slurry of particulate material comprising:

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- i) increasing the hydrophobicity of said material;
  - ii) adding at least one inorganic electrolyte to the slurry,

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cont.
- iii) adding a nonionic surfactant of low HLB number dissolved in at least one organic solvent;
  - iv) agitating said slurry to allow for said nonionic surfactant to adsorb on the surface of said material *via* hydrophobic attraction so that its hydrophobicity is increased; subjecting the agitated slurry containing said material to a filtration process in which a surface tension lowering reagent is added during the cake drying cycle time to a filter cake formed in said filtration process, said surface tension lowering agent comprising a mist; and
  - v) subjecting said filter cake a vibratory means during addition of said surface tension lowering agent.

36. (Amended) The process for claim 35 wherein said particulate matter comprises particles of less than 2mm in size.

Please add new claims 39-71.

A8

39. The process of claim 18 wherein said increasing the hydrophobicity step comprises addition of a surfactant or collector.

40. The process of claim 18 wherein said increasing the hydrophobicity step comprises increasing the hydrophobicity of said material to exhibit a water contact angle less than 90°.

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41. The process of claim 18 wherein the low HLB surfactant is selected from the group consisting of: fatty acids, fatty esters, phosphate esters, hydrophobic polymers, ethers, glycol derivatives, sarcosine derivatives, silicon-based surfactants and polymers, sorbitan derivatives, sucrose and glucose esters and derivatives, lanolin-based derivatives, glycerol esters, ethoylated fatty esters, ethoxylated amines and amides, ethoxylated linear alcohols, ethoxylated tryglycerides, ethoylated vegetable oils, and ethoxylated fatty acids.

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cont.

42. The process of claim 18 wherein said low HLB surfactant is blended with a vegetable, fish or animal oil containing triacylglycerols.

43. The process of claim 18 wherein said organic solvent includes a solvent selected from the group consisting of: light hydrocarbon oils and short-chain alcohols.

44. The process of claim 39 wherein said surfactant comprises a high HLB surfactant having a polar head configured to interact with the surface of said particulate material.

45. The process of claim 39 wherein said collectors are selected from the group consisting of: thiols and xanthates.

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46. The process of claim 25 wherein said increasing the hydrophobicity step comprises addition of a surfactant or collector.

47. The process of claim 25 wherein said increasing the hydrophobicity step comprises increasing the hydrophobicity of said material to exhibit a water contact angle less than 90°.

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cont.

48. The process of claim 25 wherein the low HLB surfactant is selected from the group consisting of: fatty acids, fatty esters, phosphate esters, hydrophobic polymers, ethers, glycol derivatives, sarcosine derivatives, silicon-based surfactants and polymers, sorbitan derivatives, sucrose and glucose esters and derivatives, lanolin-based derivatives, glycerol esters, ethoylated fatty esters, ethoxylated amines and amides, ethoxylated linear alcohols, ethoxylated tryglycerides, ethoylated vegetable oils, and ethoxylated fatty acids.

49. The process of claim 25 wherein said low HLB surfactant is blended with a vegetable, fish or animal oil containing triacylglycerols.

50. The process of claim 25 wherein said organic solvent includes a solvent selected from the group consisting of: light hydrocarbon oils and short-chain alcohols.



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51. The process of claim 46 wherein said surfactant comprises a high HLB surfactant having a polar head configured to interact with the surface of said particulate material.

52. The process of claim 46 wherein said collectors are selected from the group consisting of: thiols and xanthates.

53. The process of claim 30 wherein said increasing the hydrophobicity step comprises addition of a surfactant or collector.

54. The process of claim 30 wherein said increasing the hydrophobicity step comprises increasing the hydrophobicity of said material to exhibit a water contact angle less than 90°.

55. The process of claim 30 wherein the low HLB surfactant is selected from the group consisting of: fatty acids, fatty esters, phosphate esters, hydrophobic polymers, ethers, glycol derivatives, sarcosine derivatives, silicon-based surfactants and polymers, sorbitan derivatives, sucrose and glucose esters and derivatives, lanolin-based derivatives, glycerol esters, ethoylated fatty esters, ethoxylated amines and amides, ethoxylated linear alcohols, ethoxylated triglycerides, ethoylated vegetable oils, and ethoxylated fatty acids.

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56. The process of claim 30 wherein said low HLB surfactant is blended with a vegetable, fish or animal oil containing triacylglycerols.

57. The process of claim 30 wherein said organic solvent includes a solvent selected from the group consisting of light hydrocarbon oils and short-chain alcohols.

58. The process of claim 53 wherein said surfactant comprises a high HLB surfactant having a polar head configured to interact with the surface of said particulate material.

59. The process of claim 53 wherein said collectors are selected from the group consisting of: thiols and xanthates.

60. The process of claim 35 wherein said increasing the hydrophobicity step comprises addition of a surfactant or collector.

61. The process of claim 35 wherein said increasing the hydrophobicity step comprises increasing the hydrophobicity of said material to exhibit a water contact angle less than 90°.

62. The process of claim 35 wherein the low HLB surfactant is selected from the group consisting of: fatty acids, fatty esters, phosphate esters, hydrophobic polymers, ethers,

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glycol derivatives, sarcosine derivatives, silicon-based surfactants and polymers, sorbitan derivatives, sucrose and glucose esters and derivatives, lanolin-based derivatives, glycerol esters, ethoxylated fatty esters, ethoxylated amines and amides, ethoxylated linear alcohols, ethoxylated triglycerides, ethoxylated vegetable oils, and ethoxylated fatty acids.

63. The process of claim 35 wherein said low HLB surfactant is blended with a vegetable, fish or animal oil containing triacylglycerols.

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cont.  
64. The process of claim 35 wherein said organic solvent includes a solvent selected from the group consisting of light hydrocarbon oils and short-chain alcohols.

65. The process of claim 60 wherein said surfactant comprises a high HLB surfactant having a polar head configured to interact with the surface of said particulate material.

66. The process of claim 60 wherein said collectors are selected from the group consisting of thiols and xanthates.

Sub. B5  
67. A process for dewatering a slurry of hydrophobic particulate material comprising:

- i) adding a nonionic surfactant of low hydrophile-lipophile balance (HLB) number dissolved in at least one organic solvent;

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- Sub. P6 cont.*
- ii) ~~agitating said slurry to allow for said nonionic surfactant to adsorb on the surface of said material so that its hydrophobicity is increased; and~~
  - iii) ~~subjecting the agitated slurry containing said material to a mechanical method of dewatering.~~

68. The process for claim 67 wherein said particulate matter comprises particles of less than 2mm in size.

*Ag cont.*

69. The process of claim 67 wherein the low HLB surfactant is selected from the group consisting of: fatty acids, fatty esters, phosphate esters, hydrophobic polymers, ethers, glycol derivatives, sarcosine derivatives, silicon-based surfactants and polymers, sorbitan derivatives, sucrose and glucose esters and derivatives, lanolin-based derivatives, glycerol esters, ethoylated fatty esters, ethoxylated amines and amides, ethoxylated linear alcohols, ethoxylated tryglycerides, ethoylated vegetable oils, and ethoxylated fatty acids.

70. The process of claim 67 wherein said low HLB surfactant is blended with a vegetable, fish or animal oil containing triacylglycerols.

*as*

71. The process of claim 67 wherein said organic solvent includes a solvent selected from the group consisting of: light hydrocarbon oils and short-chain alcohols.